The majority of the large ΔP from start to finish of the transitions can be attributed to the ΔV of transition. As the metal transforms it decreases in volume. The shear strength of the talc is large enough so that pressure must be added to the system to force the talc to follow the bismuth. Boyd and England's[(3)] result using a .033 cm diameter Bi wire in .32 cm diameter AgCl in talc confirm this. Here the smallness of the ΔV of the small bismuth wire and the weakness of the surrounding AgCl cause the ΔP of the transition to be about 1.5 Kb.

Our setup used AgCl as the pressure media. However, it was necessary to protect the thermocouple wires from the reactivity of AgCl so they were sheathed in BN. BN is stronger than AgCl and therefore reacts to pressure in a similar manner to talc. We quickly found that the diameter of the BN was critical to the ΔP of transition. Figure 3 shows our final configuration with a 1 mm BN sleeve and a 0.3 mm wire. Figure 5 shows the bismuth pressure calibration for this cell with the Bi wire in the 1 mm BN sleeve in the AgCl portion.

The ΔP of transition in this configuration is about 2 Kb and the bismuth 2 $\rightarrow$ 3 transition completes at 31 Kb force/area. This represents a considerable improvement over the all talc cell originally tried (7 Kb and 44 Kb). In the actual experiment the wire of thermoelectric material does not undergo a ΔV; therefore, the ΔP down the wire is less than 2 Kb. Bridgman has shown AgCl to have a shear strength of 0.8 Kb at 25 Kb. This is the lower limit ΔP to be expected along the AgCl with no BN. Based on measurements made with other diameter BN tubes and the pressure calibrations discussed above we find the ΔP along the wire in the AgCl to be 1.0 - 1.5 Kb. For Figure 4 we have used the